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University of Iowa Studies in Psychology, No. V. Edited by Carl Emil Seashore. *Monograph Supplements to Psychological Review,* Vol. IX., No. 2, June, 1908. Whole No. 38. Pp. 148. Baltimore: The Review Publishing Co.

The latest monograph supplement to the *Psychological Review* contains a set of studies from the psychological laboratory of the University of Iowa. First in the volume is an investigation of "The Perimetry of the Localization of Sound," by Daniel Starch; the second article is on the "Transference of Training in Memory," by George Cutler Fracker; the last, on "The Effect of Practise on Normal Illusions," is by many hands—the measurements having been made by Edward A. Carter, Eva Crane Farnum, and Raymond W. Gies, the whole investigation planned and written up by the first of those just named, and the introduction and summary contributed by C. E. Seashore, the editor of the volume as a whole.

The study on localization of sound is a continuation of an investigation published in the "University of Iowa Studies in Psychology," 1905. It takes up in detail certain problems suggested by that investigation. A sound objectively uniform in intensity, it had been noticed, seemed nearer and louder in some directions than in others. To measure the extent of this variation in apparent intensity and apparent distance is one of the problems of the present investigation. An apparatus was used that was capable of producing a sound variable in intensity according to definite units. The chief parts of the apparatus were an electric fork of 100 v.d., driven by a current of three amperes and three volts which were kept constant throughout the experiments, and a Seashore audiometer, an instrument devised for the purpose of controlling and measuring the intensity of sound. "The scale of intensities, which rises from one to forty, is based on the psychophysical law, so that the ratio of any two successive increments on the scale is psychologically the same." With this apparatus the threshold of hearing was determined for each observer when the sound came from different directions around his head. The threshold was taken to measure the apparent intensity, and the apparent distance was regarded as a function of this intensity. The experiments were made on eight persons, and 700 determinations were made in each direction.

The experiments show that sensitiveness of hearing is keener to sounds coming from the side of the head than to those from front or back. Sounds of objectively equal strength consequently appear louder and nearer when coming from a point in the aural axis than when located in any other direction. The ratio of sensitivity of the side to front or back is the same, irrespective of the absolute threshold—approximately 3:4. The experiments also show that there are two types of observers, those whose threshold is lower for frontal sounds and those whose threshold is lower for sounds from behind. There was no marked difference in the results when the observers heard with only one ear. Discrimination between different intensities in the same direction is of about the same fineness whatever the direction may be, but pitch discrimination is decidedly poorer at the sides than in front or back.

Another series of experiments was undertaken to determine the influence of quality of sound upon its localization. The sounds of a singing flame, Galton whistle, tuning-fork, telephone, mere noises, and the human voice were used. The richer and more complex sounds, such as the human voice, noises, and telephone sounds, were localized much more accurately than the comparatively pure tones of the singing flame and of the fork and resonator. Localization by one ear was considerably poorer than by two, the region of greatest accuracy being on the side of the hearing ear, and the poorest on the opposite side. Angular differences of direction are overestimated in front and underestimated on the sides. Dr. Starch proposes to amend the accepted intensity theory of localization by recognizing the part played by quality. Monaural localization would be impossible if it depended upon the binaural ratio of intensity alone, and binaural localization would be much poorer than it is. "The traditional intensity theory is in the main correct, but quite inadequate. We must add to it the qualitative elements and the monaural quantitative elements. These two have coordinate value with the binaural ratio in the auditory perception of direction."

The second investigation reported in this volume, by Fracker, has to do with the question to what extent training of the memory with one sort of facts improves it for facts of another kind. Eight observers submitted to the training course, which consisted in memorizing the order in which four tones of different intensities were given. At the beginning of the course they were tested for their ability to memorize (1) two stanzas of poetry, (2) the order of four shades of gray, (3) the order of nine tones, (4) the order of nine shades of gray, (5) the order of four tones, (6) the order of nine geometrical figures, (7) the order of nine numbers, (8) the extent of arm movements. At the close of the course they were again tested. Four other observers took the tests, but not the training. Mr. Fracker comes to the conclusion that the trained subjects showed greater improvement in the final tests than did the untrained. He averages the gains of the trained eight in each test, and the gains of the untrained four, and compares average with average, showing a difference in favor of the trained eight for each test. If, however, record be compared with record, it is possible to match, from the tables submitted, nearly every low figure by one of the untrained four with an equally low one for the same test by one of the trained eight. Another finding of the investigation is that improvement in the tests was in many cases greater than in the training series. This would seem to indicate a very great degree of transference, but the significance of this result is somewhat clouded by the fact that the four who had no training are also shown to have improved (Table III.). The introspective notes of his subjects give the author good ground for observing that transference, in their cases, depended upon "the nature of the imagery employed in practise, rather than upon any other factor." These introspections confirm Professor James's remark that "all improvement of memory consists in the improvement of one's habitual methods of recording facts."

The experiments of the last study in this volume were made on the illusion of the length of a cylinder, the T-illusion, the Mueller-Lyer illusion, and the illusion of distance between circles. The subjects were taken through a course of training in each illusion with a view to determining whether continued observation and study of the illusion would cause it to diminish. The investigation showed that so long as the observer has no knowledge of the existence of the illusion it persists with undiminished force. There were no exceptions to this rule. Those who have a knowledge of the illusion are less likely to decrease the illusion by practise if they are capable of maintaining a "perceptual attitude." One who knows the illusion can learn to make proper correction for it in a judgment. "Such correction process is at first focal in consciousness, but soon becomes so automatic that the closest introspection may not trace the correction process involved in the form of an allowance for the illusion." This study contains many interesting observations of details.

A. LIPSKY.

NEW YORK CITY.

The Problem of Form in Painting and Sculpture. ADOLF HILDEBRAND. Translated by Max Meyer and Robert Morris Ogden. New York: G. E. Stechert & Co. 1907. Pp. 138.

This first English edition of Hildebrand's monograph will make more accessible to students a famous and valuable contribution to esthetics. The work is translated into clear and agreeable English. (There is, however, a serious typographical error on page 61 which makes some seven or eight lines quite unintelligible.) It contains thirty illustrations and a portrait of the author, and is prefaced by a short biographical sketch of the author. Although the first German edition appeared in 1893 and the English translation is now more than a year old, one may, perhaps, be forgiven for indicating something of the contents.

The artist must make his composition look, not as a group would in stereoscopic vision, but as it would look if projected at a distance and hence flattened into a plane. This is the visual projection or *Fernbild* of which Hildebrand makes so much. Further: "The value of a picture does not depend on the success of a deception, as does the popular value of a panorama, but on the intensity of the unitary spatial suggestiveness concentrated in it." "The aim—the presentation of a general idea of space by means of a visual perception—is the same for painter and sculptor, and the work of each is directed by the same subjective requirements, however different may be their means of representation." Objects, he says, must be arranged in unified planes or layers of space as in relief-work. The third dimension is represented by a series of these layers one behind the other.

Discussing "Form as Interpretation of Life," he says that a great many expressive movements or gestures are not available for art because they do not lend themselves to clear visual impressions. "The artistic